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REFERENCE #2

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November 12, 1981

Mr. John G. Hendrickson
Village Trustee
20700 Governors Highway
Olympia Fields, IL 60461

Dear Mr. Hendrickson:

Attached is a report on our evaluation of the well water supply for the Village of Olympia Fields. We hope this will provide you with information useful to your long-range planning program. Please feel free to contact us if we can be of additional service.

Very truly yours,
STATE WATER SURVEY DIVISION

Robert T. Sasman

Robert T. Sasman
Hydrologist

cc: Fred Keuch

Shallow Groundwater Resources
for Olympia Fields, Cook County, Illinois
by
Robert T. Sasman, Hydrologist

Dec 1981

The Village of Olympia Fields and each of the adjacent communities of Country Club Hills, Matteson, and Park Forest, as well as all the private domestic, commercial and country club wells in the area, obtain all of their water from the shallow dolomite aquifer. The Village of Flossmoor also has wells finished in the shallow dolomite, but during recent years has obtained a major portion of its water from the deep sandstone aquifer. Most of the dolomite wells have depths of approximately 300 to 450 feet. Water is present in cracks and crevices in the rock and well yields are largely governed by the extent and interconnection of crevices encountered during drilling. Most of the municipal wells yield several hundred gallons per minute.

Recharge to the shallow dolomite is from precipitation that falls locally and percolates downward through the overlying surficial deposits. Previous studies by the Water Survey indicate that average recharge rates to the shallow dolomite in the Olympia Fields area are in the range of 100,000 to 150,000 gallons per day per square mile.

The potential yield of the shallow dolomite in Rich Township has been calculated to be approximately 4.6 mgd. Total 1980 municipal pumpage was 6.0 mgd or about 30 percent greater than the potential yield. This included at least part of the pumpage for Country Club Hills, Flossmoor, Matteson, Olympia Fields, Park Forest and Richton Park. Most of this pumpage is concentrated in the southeast quarter of the township. In several areas of the Chicago metropolitan region where pumpage has exceeded the potential yield for extended periods, water levels have declined below the top of the dolomite aquifer and some well yields have decreased as much as 50 to 60 percent.

The Olympia Fields Water Department was visited on November 3, 1981, with the intent to obtain current information regarding the Village wells. A brief pumping test was conducted on each well with some water levels being measured in both wells during both tests. The non-pumping water level in Well No. 2 was 66 feet, which generally agrees with recent reported data by the water department. The well was pumped for an hour at 450 gallons per minute and the water level lowered to about 91 feet. This indicates a specific capacity of 18 gallons per minute per foot of drawdown, which is essentially the same as when the well was initially tested in 1958. While Well No. 2 was pumping, the water level in Well No. 3 apparently lowered about 0.5-0.6 feet. Some of the measurements obtained in Well No. 3 indicated a greater water-level fluctuation or the measurements were incorrect.

Our test of Well No. 3, including the measurements at Well No. 2 during this test, was less than satisfactory and we are not sure which parts of the data are reliable. If Well No. 3 is to be counted on as a major source of supply, we recommend that a more extensive test be conducted in order to be sure of the water-yielding capability.

The airline in the well used for measuring water levels gave inconsistent readings and may be defective. A steel tape was used as an alternate method and some of these readings were also inconsistent. Although the pump reportedly produces about 1000 gallons per minute, the lack of a discharge-line meter prevents accurate flow measurements.

The non-pumping water level appeared to be 67 feet, which was reasonable with a 66 foot depth in Well No. 2. Pumping at the assumed rate of 1000 gallons per minute for about an hour resulted in an apparent 91 foot pumping level. These data indicate a specific capacity of about 42 gallons per minute per foot of drawdown. This is more than double that of Well No. 2 but less than 40 percent of the initial capacity in 1965. During this test most water level measurements in Well No. 2 generally showed an influence of up to about 1.4 feet, but some measurements, particularily near the end of the pumping period showed declines of 4 to more than 7 feet.

If the non-pumping and pumping water levels and the pumping rate for Well No. 3 were correct, then the decrease in specific capacity may indicate the well bore is partially plugged. Rehabilitating the well with "treating acid" by a competent well contractor would be of benefit with this condition. An alternate possibility might be that local and regional pumpage have increased to such an extent that Well No. 3 may no longer be capable of yielding 1000 gallons per minute for more than short periods of continuous pumping.

In order to better determine the actual condition of Well No. 3, it should be pumped for several hours, with some accurate method of measuring the flow rate. Well No. 2 should be off during the test. Frequent water levels in both wells during the entire pumping period should provide useful data regarding the effects of pumping. The Water Survey would be happy to participate in such a test if desired.

Assuming the recent non-pumping water level data is at least approximately correct, there has been little water level change since the mid 1960's. During the previous ten years the water level apparently declined 15 to 20 feet. The data indicate that the rate of decline is not excessive and that non-pumping water levels are still at least 20 feet above the top of the bedrock. Apparently pumping levels are also slightly above the top of the rock.

Our records show that pumpage for Olympia Fields has increased about 46 percent since 1970 and averaged 0.61 million gallons per day in 1980. Other municipal pumpage within about a mile of the Village wells was an additional 0.5 mgd. As the distance from the Village wells increases about another mile, pumpage from shallow dolomite wells increases an additional 5 mgd.

As Lake Michigan water becomes available to more communities in south Cook County, pumpage from both shallow and deep wells will decline in proportion to the increased use of lake water. The optimum groundwater useage should not exceed the aquifer potential yield.

If all or most of the adjacent communities switch to lake water, adequate shallow aquifer should be available for Olympia Fields. However, if municipal pumpage from the shallow dolomite in Rich Township continues at the same rate as during the past 10 years, it will increase to nearly 8 mgd by 1990 and nearly 10 mgd by the year 2000.

In addition to considerations regarding the available amount of water, consideration needs to be given to water quality. Untreated water from the Village wells is extremely hard, highly mineralized, and contains considerable iron. Comparison of recent and older analyses seems to suggest the water is increasing in hardness and total dissolved mineral content. This occurrence has been observed in other areas of the metropolitan region associated with prolonged heavy pumpage and declining water levels. Increasing operation and maintenance costs for water treatment will occur with continued use of well water.

In summary, it appears as though there is sufficient water available in the shallow dolomite to provide adequate water to Olympia Fields for at least the near future. The long-range adequacy is dependent on several factors, including the anticipated growth rate, the capability of the existing facilities, and the future source of water for adjacent communities. Water quality considerations may become of increasing significance with continued use of groundwater.